Chemistry I: Practice Test: Atomic structure

1: The three basic components of an atom are:

A. protons, neutrons, and ions
B. protons, neutrons, and electron
C. protons, neutrinos, and ions
D. protium, deuterium, and tritium

2: An element is determined by the number of:

A. atoms
B. electrons
C. neutrons
D. protons

3: The nucleus of an atom consists of:

A. electrons
B. neutrons
C. **protons and neutrons**
D. protons, neutrons, and electrons

4: A single proton has what charge?

A. no charge
B. **positive charge**
C. negative charge
D. Mastercard, Visa, or American Express

5: Which particles have approximately the same size and mass as each other?

A. neutrons and electrons
B. electrons and protons
C. protons and neutrons
D. No clue. They don't stay still long enough to get weighed.

6: Which two particles would be attracted to each other?

A. electrons and neutrons
B. **electrons and protons**
C. protons and neutrons
D. all particles are attracted to each other

7: The atomic number of an atom is:

A. the number of electrons
B. the number of neutrons
C. **the number of protons**
D. the number of protons plus the number of neutrons

8: The mass number of an atom is:

A. the number of electrons
B. the number of neutrons
C. the number of protons
D. **the number of protons plus the number of neutrons**

9: Changing the number of neutrons of an atom changes the atom into a different

A. isotope
B. element
C. **ion**
D. outlook on life

10: When you change the number of electrons on an atom, you produce a different:

A. isotope
B. ion
C. element
D. atomic mass

11: According to atomic theory, electrons are usually found:

A. in the atomic nucleus
B. **outside the nucleus, yet very near it because they are attracted to the protons**
C. outside the nucleus and often far from it - most of an atom's volume is its electron cloud
D. either in the nucleus or around it - electrons are readily found anywhere in an atom

12: To change Li to Li^+, you need to:

A. add one electron
B. remove one proton
C. **remove one electron**
D. do Voodoo magic

13: Fe^{2+} and Fe^{3+} are different iron:

A. **ions**
B. isotopes
C. elements
D. atoms

14: $^{14}_{6}C$ and $^{12}_{6}C$ are examples of carbon:

A. ions
B. neutrons
C. **isotopes**
D. molecules

15: $^{13}_{6}C$ has how many protons?

A. **6**
B. 12
C. 13
D. 14

16: What is the symbol for an ion which has 8 protons and 10 electrons?

A. N^{3-}
B. **O^{2-}**
C. O^{3-}
D. F^{-}

17: What is the nuclear symbol for the isotope of oxygen which has 9 neutrons?

A. $^{16}_{8}O$
B. $^{17}_{8}O$
C. $^{18}_{8}O$
D. $^{16}_{9}O$

18: Li^{+} has how many electrons? (Hint: the atomic number of lithium is 3)

A. 0
B. 1
C. **2**
D. 3

19. An element has an atomic number of 76. The number of protons and electrons in a neutral atom of the element are ____.
    a. 152 protons and 76 electrons
    b. 76 protons and 0 electrons
    c. 38 protons and 38 electrons
    d. 76 protons and 76 electrons

21. What does the number 84 in the name krypton-84 represent?
    a. the atomic number
    b. the mass number
    c. the sum of the protons and electrons
    d. twice the number of protons

22. All atoms of the same element have the same ____.
    a. number of neutrons
    b. number of protons
    c. mass numbers
    d. Mass

23. According to the Law of Constant Proportions (Composition), a compound is always made of
    a. different elements and different ratios
    b. same elements and same ratios
    c. same elements with different ratios
    d. different elements and same ratios

24. Isotopes of the same element have different _____.
    a. positions on the periodic table
    b. chemical behavior
    c. atomic numbers
    d. mass numbers

25. According to the Law of Multiple Proportions,
    a. two elements can form different whole number ratios to make the same compound
    b. two elements can form the same whole number ratios to make the same compound
    c. two elements can form different whole number ratios to make different compounds
    d. the dead Greek dudes had no clue!

26. The atomic mass of an element depends upon the ____.
    a. mass of each electron in that element
    b. mass of each isotope of that element
    c. relative abundance of protons in that element
    d. average mass of all of the isotopes of that element

29. Which of the following is true about subatomic particles?
    a. Electrons are negatively charged and are the heaviest subatomic particle.
    b. Protons are positively charged and the lightest subatomic particle.
    c. Neutrons have no charge and are the lightest subatomic particle.
    d. The mass of a neutron nearly equals the mass of a proton.

30. What is the relative mass of an electron?
    a. 1/1840 the mass of a proton
    b. 1/1840 the mass of a neutron + proton
    c. 1/1840 the mass of a C-12 atom
    d. 1/1840 the mass of an alpha particle

31.All atoms are ____.

a. positively charged, with the number of protons exceeding the number of electrons
b. negatively charged, with the number of electrons exceeding the number of protons
c. neutral, with the number of protons equaling the number of electrons
d. neutral, with the number of protons equaling the number of electrons, which is equal to the number of neutrons

32. The nucleus of an atom is ____.

a. the central core and is composed of protons and neutrons
b. positively charged and has more protons than neutrons
c. negatively charged and has a high density
d. negatively charged and has a low density

33. The atomic number of an element is the total number of which particles in the nucleus?

a. Neutrons
b. Protons
c. Electrons
d. protons and electrons

True & False:

38. **False** The electron cloud accounts for most of the mass of an atom.

39**.TRUE** Bohr pictured the atom as having electrons in paths called *orbitals*

58. **TRUE** According to the Gold Foil experiment, atoms are mostly empty space.

59. **False** According to the Gold Foil experiment, atoms do not have a dense nucleus.

60. **False** According to the Gold Foil experiment, the nucleus of atom has a negative charge.

61. **TRUE** According to the Gold Foil experiment, atoms are mostly empty space.

62. **TRUE** In the Gold Foil experiment, beta particles were fired at thin foil.

63. **TRUE** According to the Gold Foil experiment, most of the alpha particles went straight through.

64. **.RUE** According to the Gold Foil experiment, some alpha particles were deflected.

65.**TRUE** According to the Gold Foil experiment, a few alpha particles bounced straight back at the radioactive source.